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EXAMINER

NGUYEN, LAM S

ART UNIT PAPER NUMBER

2853

DATE MAILED: 08/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohorquez (US 5357081) in view of Suzuki (US 4514737) and Doluca (US 6208127).

Bohorquez discloses a fluid ejection device comprising:

- an internal power supply path (*FIG. 3: The power line with the resistor Rp*);
- a power regulator or a power delivery control loop (*FIG. 3, element 20*) providing an offset voltage (*FIG. 3: The voltage at the positive input of element 16*) from a feedback voltage;
- a group of nozzles (*column 1, lines 25-35*);
- a corresponding group of firing resistors (*FIG. 3, element RH and column 1, lines 25-35*);
- a corresponding group of switches (*FIG. 3, element 18*) controllable to couple a selected firing resistor (*FIG. 3, element RH*) of the group of firing resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor (*FIG. 3 and column 1, lines 25-35*),
- wherein the power regulator further includes a feedback amplifier (*FIG. 3, element 16*) having a first input (*FIG. 3: The positive input of element 16*) coupled to the offset voltage (*FIG.*

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3: *The voltage outputted from the power controller 20) and a second input (FIG. 3: The negative input of element 16) coupled to the feedback, wherein the drive line (FIG. 3: The output of element 16),*

wherein a selected switch corresponding to a selected firing resistor has a control gate controlled by the drive line (FIG. 3: *The gate of element 18*);

wherein the selected firing resistor of the group of firing resistors includes a first terminal and a second terminal coupled to the feedback line, wherein the drive line provides the offset voltage to the feedback line and the second terminal of the selected firing resistor through the selected switch (FIG. 13: *The offset voltage outputted from element 16 is provided to the feedback line and the resistor RH through the switch 18*);

wherein the selected switch is coupled between the internal power ground and the second terminal of the selected firing resistor (Fig. 3, 6: *The switch 16 or Q1 is coupled the second terminal of heater RH through resistor R1 to ground RR*).

Bohorquez does not disclose wherein the power regulator provides the offset voltage ***from the internal power supply path voltage***. In other words, Bohorquez does not disclose wherein the power regulator directly connects to the internal power supply path.

Suzuki discloses a printing head driving apparatus for driving printing elements such as a coil in an impact printer (FIG. 9-10, element 14b) or a heating resistor in a thermal printer (FIG. 13, element 41 and column 7, lines 25-31). The apparatus has an internal power supply path (FIG. 9-10, element Vcc), a ground path, a switch 14a located between the ground path and a terminal of the heating resistor or the coil, and a power regulator (FIG. 9-10, elements 29-30 or 32-33) directly connecting to the internal power supply path Vcc for sensing the variation of the

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power supply to provide a signal for controlling the driving of printing elements in accordance to variations in the power source voltage (*FIG. 9-10: The voltage at the input of the op-amp 31*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the power regulator disclosed by Bohorquez such as the power regulator provides the offset voltage from the internal power supply path voltage or directly connects to the internal power supply path as disclosed by Suzuki. The motivation of doing so is to drive the printing elements in accordance to variations in the power source voltage in order to gain printing quality as taught by Suzuki (*column 2, lines 36-45*).

- In addition, Bohorquez does not disclose a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage.

Doluca discloses a power regulator that includes a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage (*FIG. 3, elements 310, 300, and 320*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the power regulator in the printing system disclosed by Bohorquez such as including a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage as disclosed by Doluca. The motivation of doing so is to obtain “programmable voltage regulators that are used to provide output voltages that can be set to provide the output voltage required” as taught by Doluca (*column 1, line 25-28*).

Allowable Subject Matter

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2. Claim 4 is allowed and the reason for allowance is indicated in the previous office action.

Response to Arguments

Applicant's arguments filed 07/27/2005 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, one of ordinary skill in the art would motivate to take a voltage sample directly from the internal power supply Vcc as disclosed by Suzuki (FIG. 9-10) rather than at a voltage divided by the firing resistor R_H and the resistor R₁ as taught by Bohorquez (FIG. 3) to feed it back to the controller for controlling the driving so that the driving is in accordance to variations in the power source voltage in order to gain printing quality. Even though, Suzuki and Bohorquez are different in the way to drive printing elements, both concern the same way to control driving by taking a sample voltage to feedback to a controller in order to adjust the driving. Moreover, even though Suzuki does not teach providing an offset voltage, Suzuki suggests using the power supply as voltage sample to control the driving, this cures the shortcoming of Bohorquez. Finally, even though the applicants asserted that Doluca fails to teach the self-calibration circuit, the applicants did not provide any evidence to support for the assertion. As a result, the argument is not persuasive.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN

August 3, 2005



HAI PHAM
PRIMARY EXAMINER